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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/464,297	12/15/1999	SHELDON ARONOWITZ	99-039	7342

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EXAMINER
BROWN, CHARLOTTE A

ART UNIT	PAPER NUMBER
1765	12

DATE MAILED: 01/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/464,297	Applicant(s) Aronowitz et al.
	Examiner Charlotte Brown	Art Unit 1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Dec 19, 2002* .

2a) ☐ This action is **FINAL.** 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *4-24* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *4-24* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. Applicant's arguments with respect to claims 4-24 have been considered but are moot in view of the new ground(s) of rejection.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 4-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puntambekar et al. (US 5,714,037) in view of Barnes (US 5,284,549).

Puntambekar discloses a method for improving adhesion between various materials utilized in the fabrication of integrated circuits. A plasma etcher is provided. A silicon oxide film is provided over the substrate. The surface of the silicon oxide film is treated with a nitrogen plasma in a reactive ion etching mode in a plasma etcher. The nitrogen treatment is a two-step process. Step 1 is an initialization step necessary to strike the plasma. In Step 2, the silicon dioxide film is treated with 100% nitrogen plasma at a flow rate of approximately 200 sccm in a plasma etcher operating at a high DC bias at approximately 950 volts or greater. The optional parameters of the etcher can be varied. During the treatment, the temperature of the lower electrode of the etcher is maintained in the range of 35-38^{0}C and the temperature of the upper

electrode is maintained around approximately 20^0C. The parameters for the etcher are set forth in Table 1. Table 1 shows that the etcher maintains an rf power of 400 WT.

Unlike the claimed invention, Puntambekar does not teach a method for maintaining an rf bias on the semiconductor substrate during the exposure of the oxide surface to a remote nitrogen plasma.

Barnes discloses a reactive ion etching method for etching silicon dioxide (SiO_2) over an etch stop material on a workpiece in an etching chamber. A RIE etching plasma is provided that contains nitrogen and CHF_3 (Column 3, lines 8-24). A pressure in the range of about 200-1,000 mTorr is provided. An appropriate RF bias power in the range of about 500-700 Watts is provided for a 125 mm substrate (Column 3, lines 46-58). Therefore, the oxide thickness is dependent upon the power level of the rf bias on the semiconductor substrate. The present inventors have discovered that with these materials and process parameters, the RIE process yields a desirably high etched layer/ etch stop, etch rate selectivity of greater than 20:1 (Column 3, lines 65-68).

It is the Examiner's position that a person having ordinary skill in the art would have found it obvious to modify Puntambekar with the method of maintaining an RF bias power on the semiconductor substrate as taught by Barnes. This additional step would have been expected in order to selectively etch silicon oxide (Column 2, lines 65-68).

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. (US 6,136,211)

5. Any inquiry concerning this communication from the Examiner should be directed to Charlotte A. Brown whose telephone number is (703) 305-0727. The Examiner can normally be reached during the hours of 9:00AM to 6:30PM.

The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

CAB

January 2, 2003

Robert Kunemund
Patent Examiner
A.U. 1763